

Takaaki YAMAGISHI\* and Shuji ARAI\*\*: *Scenedesmus* in the  
suburbs of Tatebayashi City, Japan

山岸高旺\*・荒井修二\*\*: 館林市周辺池沼産のセネデス属

(Pl. XIX)

For several years we have been collecting the phytoplankton in five ponds, Morinji-numa Pond, Jo-numa Pond, Tatara-numa Pond, Kondo-numa Pond and Itakura-numa Pond, in the suburbs of Tatebayashi City, Gunma Prefecture, Japan. Recently the bodies of water were very polluted by the drainage from the plants and dwellings lying around these ponds.

The planktonic algal flora of these ponds was found to be rich with many genera represented, especially of unicellular colonial members belonging to the Chlorococcales. Observations were started in 1965 and continued in 1966 and 1967 with regular sampling from April to August of these successive years.

The following is a list of *Scenedesmus* identified in the collections. Among these species, 11 forms are newly recorded in Japan, to which some taxonomical notes were given.

1. *Scenedesmus abundans* (Kirchner) Chodat var. *abundans*

Morinji-numa (Aug., 1965 and 1966; May and July, 1967). Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Itakura-numa (May, 1967). Rare. This species and var. *longicauda* were found in several ponds, although their number were so small. The local forms exhibited somewhat smaller dimensions than the usual forms.

1'. *S. abundans* (Kirchner) Chodat var. *longicauda* G.M. Smith

Morinji-numa (May, 1967). Very rare.

2. *S. acuminatus* (Lemmermann) Chodat var. *acuminatus*

Morinji-numa (May and Aug., 1967). Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Common.

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2'. *S. acuminatus* (Lemmermann) Chodat var. *elongatus* G.M. Smith in Trans. Amer. Micros. Soc. 45: 189, Pl. 16, f. 13-15, 1926; Uherkovich in Scenedes. Ungarns, 43, Pl. 3, f. 80, 1966. (Fig. 1-1; Pl. XIX-13)

Coenobia curved, generally of 4 cells with each 2 cells adjoined in the median portion; cells lunate and strongly arcuate with the gradually tapering ends; cell walls smooth, without teeth, granulation or spines; cells 2-5  $\mu$  broad, 40-50  $\mu$  long (between apices).

Morinji-numa (Aug., 1967). Rare. New to Japan. This large variety was found infrequently in one vial containing the typical forms Morinji-numa Pond. They are distinguished from the type in having the elongate and strongly recurved cell.

3. *S. acutus* Meyen

Kondo-numa (Aug., 1967). Rare.

4. *S. arcuatus* Lemmermann

Kondo-numa (Aug., 1967). Rare.

5. *S. armatus* Chodat var. *armatus*

Morinji-numa (May, 1967). Jo-numa (May, 1967). Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Itakura-numa (Aug., 1966). Very common.

5'. *S. armatus* Chodat var. *bicaudatus* Chodat

Jo-numa (Aug., 1966). Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Itakura-numa (May, 1967). Common.

6. *S. bernardii* G.M. Smith in Bull. Wiscon. Acad. Sci. Arts & Lett. 18: 436, f. 196-208, 1916; — in Bull. Wiscon. Geol. Nat. Hist. Surv. 57: 152, Pl. 38, f. 5-9, 1920; — in Trans. Amer. Micros. Soc. 45: 189, Pl. 16, f. 16-18, 1926; Chodat in Rev. Hydrol. 3: 154, f. 46, 1926; Prescott in Univ. Iowa Stud. Nat. Hist. 13: 75, Pl. 16, f. 12, 1930; Scott & Prescott in Rec. Amer.-Aust. Sci. Exp. Arnhem Land 3: 17, f. 25-29, 1958.

Syn. *S. acuminatus* (Lagerh.) Chodat var. *bernardii* (G.M. Smith) Deduss; Uherkovich in Sceneds. Ungarns, 43, Pl. 3, f. 79, 1966 (Fig. 1-2; Pl. XIX-14)

Coenobia of generally 8 cells, alternately arranged in contact with apices or median portion of adjacent cells; interior cells fusiform, lunate or sigmoid with acute apices; terminal cells fusiform to lunate, frequently at an angle to the plane of the coenobia, and contact with the interior cells by the apex only; cell wall smooth, without terminal spine or teeth; cells 3-5  $\mu$  broad, 15-17  $\mu$  long.

Morinji-numa (Aug., 1967). Rare. New to Japan. In the present collection this alga was found only in small numbers from Morinji-numa Pond. This species closely resembles *S. acuminatus*, but it is distinctly separated from the latter in having the loose alternate arrangement and the narrow contact between the cells.

7. *S. bicaudatus* (Hansgirg) Chodat

Morinji-numa (Aug., 1966; May, 1967). Kondo-numa (Aug., 1967). Common.

8. *S. bijuga* (Turpin) Lagerheim

Jo-numa (May, 1967). Rare. Often irregularly arranged coenobia were found in our collection.

9. *S. carinatus* (Lemmermann) Chodat

Itakura-numa (May, 1967). Rare.

10. *S. denticulatus* Lagerheim var. *denticulatus*

Morinji-numa (Aug., 1966; May, 1967). Jo-numa (May, 1967). Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Common.

10'. *S. denticulatus* Lagerheim var. *linealis* Hansgirg

Kondo-numa (Aug., 1967). Rare.

11. *S. dimorphus* (Turpin) Kuetzing

Jo-numa (May, 1967). Itakura-numa (May, 1967). Common.

12. *S. ecornis* (Ralfs) Chodat

Kondo-numa (Aug., 1967). Rare.

13. *S. ellipsoideus* Chodat

Itakura-numa (May, 1967). Rare.

14. *S. granulatus* W. & G.S. West f. *disciformis* Hortbágyi; Uherkovich in Scenedes. Ungarns, 63, Pl. 7, f. 284-289, 1966. (Fig. 1-3; Pl. XIX-21)

Coenobia flat, of 4 cells irregularly arranged, without any interstices between the cells; cells ovoid to ellipsoid; cell walls granulated; cells 4-7  $\mu$  broad, 6.5-10  $\mu$  long.

Kondo-numa (Aug., 1967). Very rare. New to Japan. The type with oblong cells, 6-6.5  $\mu \times$  20-21  $\mu$ , occurs in Europe, but has not yet been reported from our country. This variety is distinguished from the typical form in having ovoid to ellipsoidal cells and the irregular arrangement of them. Only a few specimens were found in our collections.

15. *S. intermedius* Chodat var. *intermedius* Chodat in Rev. Hydrol. 3:

231, f. 135, 1968; Uherkovich in Scenedes. Ungarns, 93, Pl. 14, f. 560-578, 1966. (Pl. 1, f. 4; Pl. 2, f. 15)

Coenobia flat, of 2-4-8 cells alternately arranged; cells ovoid to oblong ellipsoid; terminal cells with 7-9  $\mu$  long spine at both ends; interior cells without spines; cells 4-9  $\mu$  broad, 8-9  $\mu$  long.

Itakura-numa (May, 1967). Common. New to Japan. This species occurred commonly in Itakura-numa Pond, mixing with the variety listed below.

15. *S. intermedius* Chodat var. *balatonicus* Hortbágyi; Uherkovich in Scenedes. Ungarns, 94, Pl. 14, f. 591-592, 1966. (Fig. 1-5; Pl. XIX-16)

Interior cells with 5-7  $\mu$  long spines at one pole only.

Itakura-numa (May, 1967). Common. New to Japan. This variety is separated from the type in having the interior cells with the characteristic spines. Many specimens of this variety were found in one vial together with the type.

16. *S. javanensis* Chodat in Rev. Hydrol. 3: 157, f. 47, 1926 (Fig. 1-6; Pl. XIX-18)

Coenobia of 4 or 8 cells; cells fusiform to lunate with acute apices, alternately arranged in contact with apices or median portion of adjacent cells; cell walls smooth, without terminal spines or teeth; cells 4-5  $\mu$  broad, 35-41  $\mu$  long.

Morinji-numa (Aug., 1967). Rare. New to Japan. Only a few specimens were found in our collections. This species is near *S. acuminatus* in the shape of cells, but differs from it chiefly in having the coenobia with large interstices between the component cells.

17. *S. longispina* Chodat

Morinji-numa (Aug., 1965, 1966 and 1967). Jo-numa (May, 1967). Kondo-numa (Aug., 1967). Itakura-numa (May, 1967). Common.

18. *S. maximus* (W. & G.S. West) Chodat

Morinji-numa (May, 1967). Jo-numa (May, 1967). Tatara-numa (Aug., 1967). Abundant. This species was found abundantly in several ponds.

19. *S. microspina* Chodat in Rev. Hydrol. 3: 232, f. 137, 1926; Uherkovich in Scenedes. Ungarns, 105, f. 695-698, 1966. (Fig. 1-7; Pl. XIX-20).

Coenobia flat, of 4 cells; cells oblong to ellipsoid; terminal cells with 1-2  $\mu$  long spines; interior cells without spines; cells 3.5-4  $\mu$  broad, 8-9  $\mu$  long.

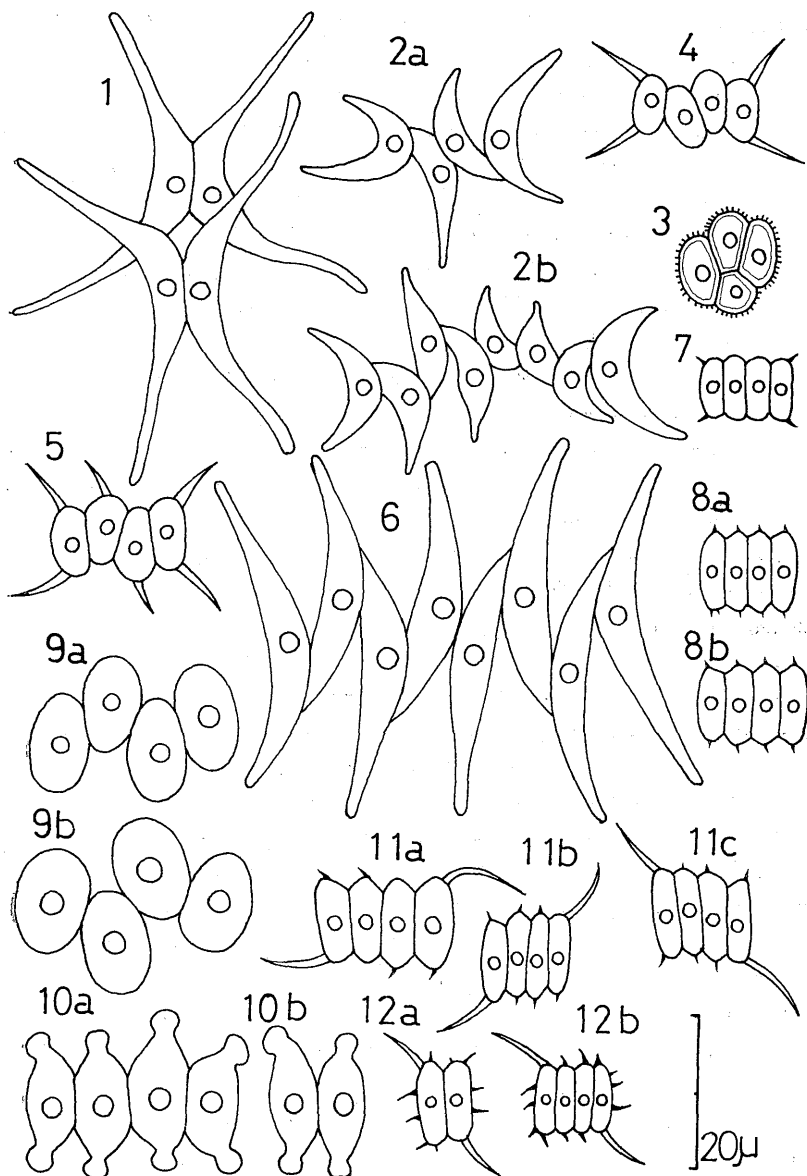


Fig. 1. 1-12. 1. *S. acuminatus* var. *elongatus*. 2a-b. *S. bernardii*. 3. *S. granulatus* f. *disciformis*. 4. *S. intermedius*. 5. *S. intermedius* var. *balatonicus*. 6. *S. javanensis*. 7. *S. microspina*. 8a-b. *S. minutus*. 9a-b. *S. ovalternus* var. *graevenitzii*. 10a-b. *S. productocapitatus*. 11a-c. *S. quadricauda* var. *longispina* f. *asymmetricus*. 12a-b. *S. spinosus* var. *bicaudatus*. (all figures ca.  $\times 1000$ )

Kondo-numa (Aug., 1967). Very rare. New to Japan. The species is similar to *S. quadricauda* in the shape of coenobia and cells, but distinguished from the latter in having short spines at both ends of the terminal cells.

20. *S. minutus* (G.M. Smith) Chodat in Rev. Hydrol. 3: 187, f. 87, 1926. (Fig. 1-8a-b; Pl. XIX-19)

Coenobia flat, of 4 or 8 cells, arranged in a linear series; cells oblong ellipsoid with 1-2  $\mu$  long spines at both poles; cells 3-4  $\mu$  broad, 9-10  $\mu$  long.

Itakura-numa (May, 1967). Very rare. New to Japan. This minute species was found in small numbers in our collections.

21. *S. obliquus* (Turpin) Kuetzing

Jo-numa (Aug., 1966; May, 1967). Itakura-numa (May, 1967). Common.

22. *S. opoliensis* Richter.

Morinji-numa (Aug., 1965, 1966 and 1967; May, 1967). Jo-numa (Aug., 1966; May, 1967). Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Itakura-numa (May, 1967). Common.

23. *S. ovalternus* Chodat var. *graevenitzii* (Bernard) Chodat in Rev. Hydrol. 3: 165, f. 52, 1926; Uherkovich in Scenedes. Ungarns, 48, Pl. 5, f. 132-136, 1966. (Fig. 1-9a-b; Pl. XIX-21a-b)

Coenobia of 4 or 8 cells; cells ovoid to ellipsoid, arranged in a very marked alternate series; cell walls smooth, without teeth or spines; terminal cells sometimes denoted at outside only; cells 4-8  $\mu$  broad, 9-15  $\mu$  long.

Tatara-numa (Aug., 1967). Rare. New to Japan. This variety is a little larger than the typical form in all dimensions, but the alternate arrangement of the component cells is a distinct character.

24. *S. producto-capitatus* Schumula in Hedwigia 49: 85, f. 1-5, 1910; Smith in Trans. Wiscon. Acad. Sci. Arts & Lett. 18: 451, Pl. 25, f. 11, 1916; Arai in Saitama Biol. 7: 25, f. 8a-b, 1967. (Fig. 1-10a-b; Pl. XIX-24)

Coenobia flat, of 2 or 4 cells, arranged regularly in a single row, in contact with half or third portion of lateral walls; cells ellipsoid with one, rarely two, protuberances at both ends; cell walls smooth, without teeth or spines; cells 5-8  $\mu$  broad, 15-20  $\mu$  long.

Morinji-numa (Aug., 1965, 1966 and 1967; May, 1967). Common. This peculiar species was previously known only from Europe, although it was commonly found in our collections from Morinji-numa Pond. This local form has dimensions somewhat larger than the original specimen, 3-3.5  $\mu$  broad

and 11–14  $\mu$  long. Furthermore, some of them have two protuberances at both ends. In other respects our materials seem entirely typical.

25. *S. quadricauda* (Turpin) Brébisson var. *quadricauda*

Morinji-numa (Aug., 1965, 1966 and 1967). Jo-numa (Aug., 1967; May, 1967). Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Itakura-numa (Aug., 1966; May, 1967). Abundant.

25'. *S. quadricauda* (Turpin) Brébisson var. *longispina* (Chodat) G.M. Smith f. *assymmetricus* (Hortbágyi) Uherkovich in Scenedes. Ungarns, 81, Pl. 12, f. 471–477, 1966. (Fig. 1–11a–c; Pl. XIX–23a–b)

Coenobia flat, of 4 cells arranged in a single linear series; cells cylindrical ovoid, with more round or slightly acute poles; terminal cells with a single, 7–10  $\mu$  long spine at one pole, a single 1–2  $\mu$  long spine another pole to the opposite direction; interior cells with a short spine at each pole or one pole; cells 3–5  $\mu$  broad, 10–14  $\mu$  long.

Morinji-numa (May, 1967). Rare. New to Japan. This alga was found associating with the type in one vial, although their numbers were so small. This variety is distinctly characterized by its terminal cells with a long spine at one pole only which separate it from the related species *S. bicaudatus*.

26. *S. quadrispina* Chodat

Jo-numa (May, 1967). Itakura-numa (May, 1967). Rare.

27. *S. seratus* (Corda) Bohlin

Tatara-numa (Aug., 1967). Kondo-numa (Aug., 1967). Very rare.

28. *S. spinosus* Chodat var. *bicaudatus* Hortbágyi; Uherkovich in Scenedes. Ungarns, 109, Pl. 19, f. 754–770, 1966. (Fig. 1–12a–b; Pl. XIX–17)

Coenobia flat, of 2 or 4 cells arranged in a linear series; cells oblong ellipsoid; terminal cells with a single, 5–7  $\mu$  long spine at one pole, a single 1–3  $\mu$  long spine another pole to the opposite direction and some short spines at out sides; interior cells with a single, 1–2  $\mu$  long spine at each pole; cells 2.5–3  $\mu$  broad, 5–7  $\mu$  long.

Itakura-mura (May, 1967). Very rare. New to Japan. This variety is similar to *S. quadricauda* var. *longispina* listed above, but the short spines arranged at outer margins of the terminal cells is a distinct character. The present specimens were found in small numbers, mingled with other species from Itakura-numa Pond.

## Explanation of Plate XIX

13. *S. acuminatus* var. *elongatus*, 14. *S. bernardii*, 15. *S. intermedius*, 16. *S. intermedius* var. *balatonicus*, 17. *S. spinosus* var. *bicaudatus*, 18. *S. javanensis*, 19. *S. minutus*, 20. *S. microspina*, 21. *S. granulatus* f. *disciformis*, 22a-b. *S. ovalternus* var. *graevenitzii*, 23a-b. *S. quadricauda* var. *longispina* f. *asymmetricus*, 24. *S. producto-capitatus*. (all figures ca.  $\times 1000$ )

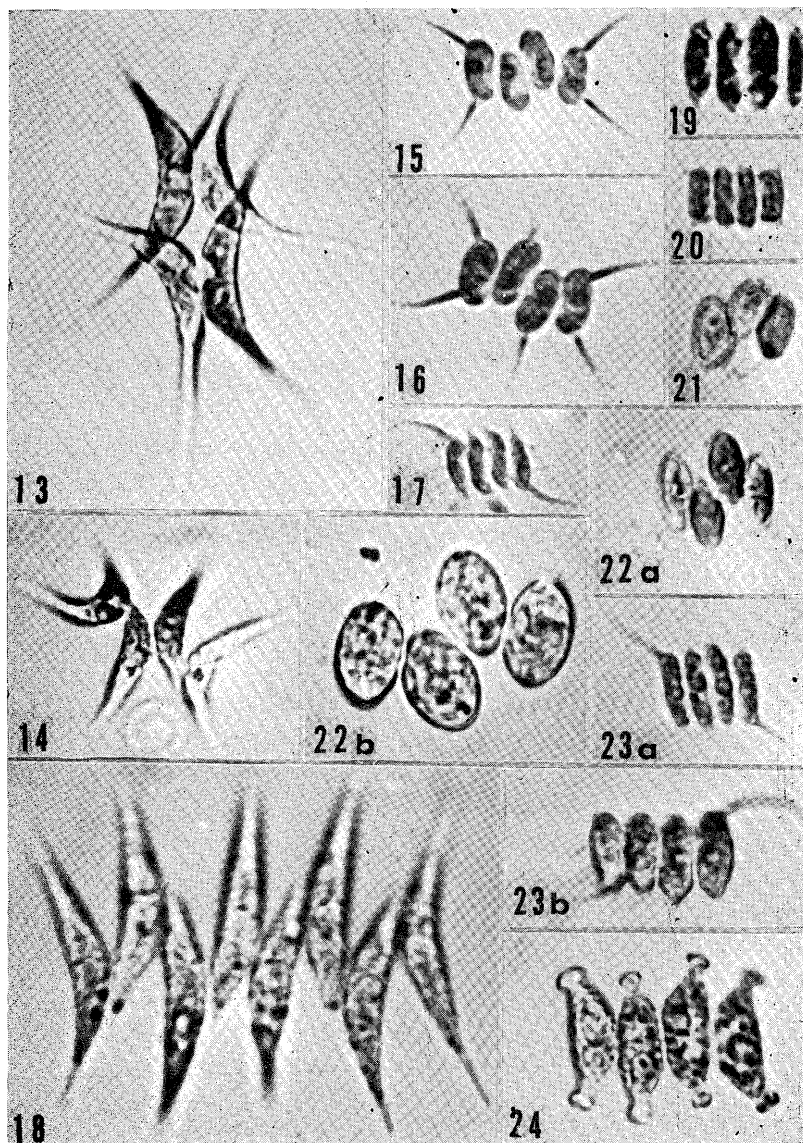
\* \* \* \*

筆者らは 1965~1967 年の 3 年間、4~8 月の期間を通して、群馬県館林市周辺にある茂林寺沼、城沼、多々良沼、近藤沼、板倉沼のプランクトン相の調査を行なった。ここではその調査中に採集した試料の中から同定することのできたセネデスムス属 *Scenedesmus* について報告した。これらの中で *S. producto-capitatus* Schumula は世界的にみても稀産の種である。また、つぎの各種は日本新産である。*S. acuminatus* var. *elongatus* G.M. Smith, *S. bernardii* G.M. Smith, *S. granulatus* f. *disciformis* Hortbágyi, *S. intermedius* Chodat, *S. intermedius* var. *balatonicus* Hortbágyi, *S. javanensis* Chodat, *S. microspina* Chodat, *S. minutus* (Smith) Chodat, *S. ovalternus* var. *graevenitzii* (Bernard) Chodat, *S. quadricauda* var. *longispina* f. *asymmetricus* (Hortbágyi) Uherkovich, *S. spinosus* var. *bicaudatus* Hortbágyi.

口武田久吉：登山と植物（日本岳人全集 第 7 回配本）707 ページ 2,000 円 昭和 44 年 2 月発行。日本文芸社（東京）植物学者の著書が山岳家の全集中に入っていておかしいことはないが、見落とし勝ちであるので御紹介したい。著者の武田久吉先生については今更説明を必要としない。抄読者の私が大正 12 年前後中学生の時に、当時の科学普及雑誌としての科学知識や科学画報の誌上で、先生の富士の植物や木の芽の形態観察を書かれたのに大変惹かれたのを思い出す。それがこれには纏めてのっているもので懐しさがひとしおであった。昭和 13 年に出た名著「登山と植物」を骨子にして、最近に書かれた随筆などを集めたものであるが、含蓄のある先生の文章は行間に先生の人生観が流れていて教えられるところが多い。また高嶺の花と題した 100 ページをこえる章は代表的な高山植物について、多年経験された生態的な性質や、その植物の発見史や民俗的なつながりなど幅のひろい知識がえられて、貴重な資料である。明治 39 年の博物之友に載った「富士山を越ゆるの記」は今日の富士山と対比して社会的な変化とフロラ的变化を知ることができてまことに興味が深い。巻末に年譜と山行年表とがある。

（前川文夫）





T. YAMAGISHI and S. ARAI: *Scenedesmus*